

Surficial geochemical exploration tools for porphyry Cu-Mo mineralization in glaciated and till-covered terrain: An example from Highland Valley Copper, south-central British Columbia (project update)

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Five known porphyry-style Cu-Mo mineralized bodies occur at Highland Valley Copper (HVC), centrally located within the Guichon Creek batholith in south-central British Columbia. These mineralized clusters include: 1) the active producing Valley, Lornex and Highmont deposits; 2) the past producing Bethlehem deposit; and 3) the buried J.A. target. The Highmont South target is a zone of buried, undeveloped mineralized bedrock south of the main Highmont deposit. The region is interpreted as a small area of auxiliary mineralization to the main Highmont deposits¹. Surficial geochemical exploration models and strategies for the exploration of porphyry-Cu deposits in glacially-covered terrain will be developed over the Highmont South target which sits under 2-9 m of till. Prior to surficial geochemical sampling, detailed surficial mapping of the study area allows the selection of the most suitable sample sites as well as the integration and full understanding of geochemical data in terms of different surficial materials and processes. Data from soil, vegetation and soil hydrocarbon samples, as well as physicochemical soil measurements (e.g. soil pH) are used to define the surficial response to the presence of buried mineralization. Interpretation of certain anomalous results in the context of the surficial map allows the identification of processes contributing to the generation of false anomalies in the data. A surficial response to mineralized bedrock at Highmont South is hypothesized to be the result of a combination of local glacial clastic transport and vegetation cycling from mineralization. Ongoing investigations will determine whether there is an expression of vertical ion transport from buried mineralization to the surficial environment. Laboratory methods to determine the source of anomalous elements in soils over mineralization include a sequential extraction, Cu isotope analysis and a visual investigation for the presence of glacially-transported clastic sulphides. NSERC-CMIC-Footprints Exploration Project Contribution #130.